

Teacher-researchers and the discovery and dissemination of professional practice



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Peter Farrell provides some interesting insight into the importance of teacher research and gives examples of his own research from his personal classroom experiences. The importance of disseminating findings from the classroom as professional development is discussed.

Teacher-research and professional learning

Practitioner-led research has been identified by the Department of Education and Early Childhood Development, Victoria (DEECD) as a way for government-school teachers to engage in worthwhile professional learning that will result in improved learning outcomes for students (DEECD, 2012, p. 15). It is proposed that government-school teachers will “investigate issues and explore solutions to teaching problems they face in their own school setting” (p. 15). It is anticipated that research projects will be carried out bi-annually and that the results will be documented in research articles (p. 19). It could be argued that all teachers, not just those working in government schools, might benefit from participating in such a process, however the nature of these articles is not clear to me, nor is how they will be published.

If the goal of the teacher-research is to produce what Reid and Green (2009, p. 174) characterise as “insider/outsider knowledge in, for and with the profession, rather than external information generated about the profession,” then the research methodologies described by Donald Schön may be of use. Schön (1987) discusses the differences between academic and professional experimentation, and makes the point that the rigor strived for in hypothesis testing is not possible under the conditions prevailing in professional practice. Schön (1987) claims that practitioners will set up an experiment with a desired

outcome in mind and will manipulate the variables, if they can, to make their hypothesis come true. As well as hypothesis testing, Schön (1987) also describes other forms of experimentation carried out by practitioners like exploratory experimentation and move-testing experimentation. Exploratory experimentation describes an approach where an “action is undertaken *only* to see what follows, without the accompanying predictions or expectations” (p. 70). Move-testing is “an action undertaken with an end in mind ... one either gets the intended consequence or does not” (p. 71).

Experiments that might be set up by our teacher-researchers should investigate any professional practice that:

- is derived from any theory (contradictory, not fully elaborated or understood) that names, informs and justifies practice;
- is driven by an intention;
- is mediated by a particular interaction between individuals;
- is shaped by physical and material circumstances, or patterns of work; and/or
- tests any assumption implicit in their own work.

The list suggests that a broad range of professional inquiry is possible. Some examples of my own work around teaching and learning mathematics are as follows.

Experiment 1: Teaching long multiplication

Some years back, I was concerned about my students’ lack of success with multiplying two-by-two and two-by-three digit numbers together, and the issue became even more problematic for them once numbers with decimals were included. My students’ confidence was trending the wrong way too and something needed to be done (driven by intention). Extensive Internet-based research eventually brought to light Wenyuan Gu’s (2001) report about the use of the lattice method to improve learning outcomes for special needs students. I had no special needs students myself, or any particular knowledge of special learning theories (derived from a theory), but I read the report with great

interest and quickly determined that this was an approach that could be used in my classroom with my students at that particular time (mediated by a particular interaction).

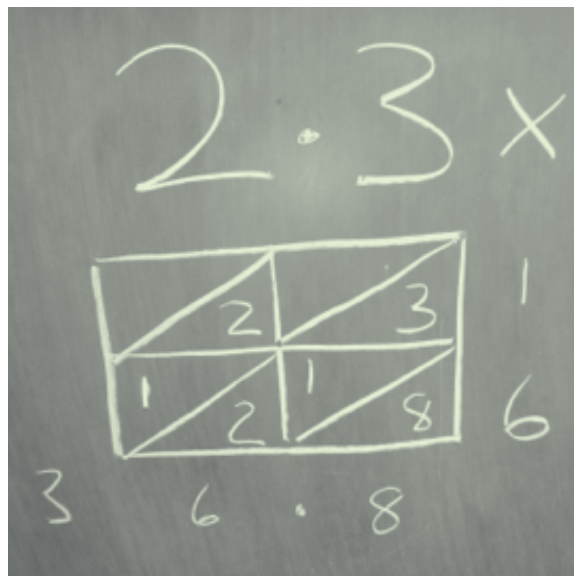


Figure 1. Solving a multiplication problem using the lattice method.

One of the advantages of the lattice method is that it separates the multiplying and addition steps involved in long multiplication, and it is quite easy to determine where the problems are. The new approach re-established student confidence and enabled them to successfully tackle long multiplication problems. The teaching of the lattice method has since become embedded in my professional practice and I have shared Gu’s (2001) report, as well as the method itself, with colleagues. What I did not do was write this move-testing experiment up. At the time I was simply addressing a problem of professional practice and did not even consider writing about it. I think an important point to make to our future teacher-researchers is that how they address problems of professional practice is precisely the sort of material that should be shared.

Experiment 2: Teaching multiplication tables

This experiment was shared via the pages of *Prime Number* (Farrell, 2011a). Each year I would wheel out a blank 10 × 10 grid and have the children fill it in as best they could. Next the students would tackle worksheets

addressing particular times-tables facts. Following a week or so of worksheets, the students would be retested and while some improvement was observed, it never seemed to last. My whole approach was shaped by a pattern of work that had nothing to do with outcomes. My assumption was that children learned their tables—not that I needed to come up with a better way to teach them their tables (tests assumptions). Unlike Experiment 1 where I deliberately sought out an article to solve a problem of practice, this time I found an interesting paper while involved in other work. However, I quickly recognised that it would work for my multi-grade class (mediated by interactions and shaped by circumstances). Feedback from colleagues suggests that they found the article easy to read and potentially useful to their practice.

Experiment 3: Identifying mathematical misunderstandings in the students and their teacher

In 2011, I attended RMIT University to complete the Postgraduate Certificate in Primary Mathematics Teaching. The course included residential and online components and was assessed in two ways:

- through professional reflection with my tutor using *Pebble Pad*, an online platform; and
- through reporting on an experiment carried out in my own classroom.

There was a lot of latitude allowed with respect to the structure of the report and I submitted what I called a “professional mini-thesis” (Farrell, 2011b). My personal view is that professional research should be done differently to academic research. In a nutshell, I think professional research should start with the problem of practice and not the gaps and conundrums in academic literature.

My research was about how I tutored my multi-grade students as they used *Mathletics* (shaped by physical and material circumstances) and I wondered whether my diagnosis of the root causes of their problems answering some questions were appropriate (tests assumptions). One aspect of my research

was how I adjusted my approach to my teaching as my own awareness and understanding of common conceptual weaknesses improved (derived from theory that informs practice).

Notwithstanding the topic of the research, one of the central requirements of the teacher-researcher must be to communicate his or her findings to others. Higgs, McAllister and Whiteford (2009, p. 115) define praxis artistry as the “kind of knowing associated with professional artistry... [Where] personal experience is placed within a framework of propositional and professional knowledge in a way that gives this experience meaning and ... enables that meaning to be transmitted to others.” The three examples of experiments provided above range from quite small to quite large undertakings, and each encompasses a range of professional practice. Experiment 1 was considered quite unremarkable at the time but could easily have been written up for a wider audience. Experiment 2 was about recognising a good idea and making the effort to give it a go. It was written up as part of a course requirement but this was not an onerous task. Undertaking long-term professional learning or postgraduate studies will often lead to the generation of material of interest to a professional audience.

Publish (where?) or perish

This brings us back to one of the original requirements set down by the DEECD where they require each government teacher to publish research every two years. There are perhaps 51 000 teachers who belong to the Australian Education Union (Victorian Branch) of which 25 000 will be expected to publish their findings each year. Who will publish this work? Existing peer reviewed journals, professional magazines, blogs or the Ultranet (the DEECD’s own intranet)? What will be the process for approval to publish? An editorial review board, a single editor, self-approved or via the school principal? Given the proposed link between carrying out research, performance and development and pay, the school principal will need to sign off on the research. The majority of peer-reviewed journals may not be interested in teacher-research because the approach may not reflect a science-based methodology, lack

rigor (Schön 1987, p. 70), or may be too limited in its scope and depth. This leaves the professional magazines. There are just a small number of appropriate professional magazines in Victoria—and they will probably be overwhelmed by the sheer number of papers. An alternative for the Department could be to create its own (online) magazine with continuous publishing or perhaps host an online forum. An online forum would also allow for the continuous publishing of work, which can be moderated, but, more importantly, an online forum allows for follow up professional discussion, judgement, and reflection. *The Conversation* comes to mind as a potential model for in-depth, mediated, discussion of online published articles (see <http://theconversation.com/au>). Sensitive search functions will facilitate simple checking of the professional literature and, as it is anticipated that many teacher-research projects may simply replicate what has been done elsewhere, threads will develop over time into substantial bodies of professional knowledge. I believe academics could and should share the space but mainly as readers and commentators. Any contribution they make should contribute to the practical knowledge tradition and be concerned with their work as teacher-researchers in the tertiary sphere.

Prime Number, the magazine published by the Mathematical Association of Victoria (MAV) includes three types of articles that may be of interest: *This Works for Me*, *Teacher Talk* and *Resource Review*. The first type of article is more about the personal work of an individual teacher in their own classroom, whereas the second type of article has a wider application to other teachers in other classrooms. A resource review article is quite simply a road test of a particular resource. In each case, articles rarely exceed 2000 words and only contain a handful of references. The present paper, a desktop study, might be considered Teacher Talk: it is approximately 2400 words in length and includes nine references (three of these are chapters from the same edited book). However, no experiment has been carried out, but there has been a search of the literature and some attempt to place the writer in the narrative. Would the present article be considered teacher-research? I would argue that it is.

In conclusion

It is my judgement that having teachers engaged in researching their own practice on a regular basis is a laudable aim and one that will, in my opinion, bring about the development of a cohort of truly expert-level teachers in our system. I would caution that the teacher-research undertaken must be embedded in the practical knowledge tradition and not the science-based tradition, as its ultimate aim must be to improve teachers and teaching. To this end, a professional—as opposed to an academic—mindset needs to be adopted by the participants engaged in this work. Of critical importance will be addressing how and where the research will be published and, more importantly, discussed with and by other professionals across Australia. With the rollout of a national curriculum, sharing our professional practice will take on greater significance if we are to realise learning improvement across the nation.

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